



NOBEL CAUSE

SYMPOSIA SERIES ON GLOBAL SUSTAINABILITY

4th Nobel Laureates Symposium on Global Sustainability

"4C: Changing Climate, Changing Cities"

22nd - 25th April 2015, Hong Kong

Program Outline as of 10 April, 2015



POTSDAM INSTITUTE FOR
CLIMATE IMPACT RESEARCH





PUBLIC PROGRAM

Wednesday, 22nd April, 201515:45 – 16:00 **Guest Registration****Inaugural Public Program: Sustaining Humanity in the Midst of Climate Change - A Dialogue with Nobel Laureates**

"We are poised to do more damage to the Earth in the next 35 years than we have done in the last 1,000." – Brian Schmidt, Astrophysicist & 2011 Recipient of Nobel Prize in Physics

Global average temperatures are set to rise four degrees Celsius by the end of the century, should we not take steps to combat climate change and reduce greenhouse gas emissions. Experts warn that a rise of this magnitude would reshape the planet and could lead to catastrophic consequences. Further contributing to the precarious state of the planet are issues such as deforestation, soil and water degradation, ocean acidification, chemical pollution and environmentally-triggered disease. This is exacerbated by the impact of rapid urbanization, particularly in Asia, where many emerging economies rely on dirty fossil fuel to power their growth leading to significant problems should these nations fail to adopt cleaner alternatives. To mitigate some of these adverse effects, major changes are necessary in how we live, work and travel. Join us for the inaugural public program of the *4th Nobel Laureates Symposium on Global Sustainability* during which Nobel Laureates from various disciplines will debate some of the core problems associated with climate change and discuss sustainable solutions to ensure that humanity can continue to support itself ecologically and economically.

Moderator: Gabriel Lau (*AXA Professor of Geography and Resource Management, The Chinese University of Hong Kong*)

16:00 – 17:30 **Peter Doherty** (*1986 Recipient of the Nobel Prize for Physiology and Medicine*)
Y. T. Lee (*1986 Recipient of the Nobel Prize for Chemistry*)
Brian Schmidt (*2011 Recipient of the Nobel Prize for Physics*)
Ada Yonath (*2009 Recipient of the Nobel Prize for Chemistry*)

CORE PROGRAM

Wednesday, 22nd April, 2015

18:00 – 21:00 **Pre-Opening Welcome Dinner hosted by Mr. C.Y. Leung, Chief Executive, Hong Kong Special Administrative Region**

**Thursday, 23rd April, 2015: DAY 1**08:30 – 09:00 **Registration****Opening Addresses**

09:00 – 09:30

Welcome and Opening by**Mr. Ronnie C. Chan, Co-Chair, Asia Society****Mr. Hans Joachim Schellnhuber, Director, Potsdam Institute for Climate Impact Research****Mr. C.Y. Leung, Chief Executive, Hong Kong Special Administrative Region****Session 1: Cities, Climate and Civilization**

Half of the world's population already live in cities. In addition, urban areas are expected to absorb all increases in world population adding three billion urban dwellers by 2050. Most of this increase in urban population will occur in Asia. Before the 19th century, global urban population never exceeded 5-10% of the total population, demonstrating the huge scale and pace of the contemporary urbanization process. Urban areas contribute over-proportionally to climate change; roughly 70% of final energy use and 75% of CO₂ emission from energy use globally are caused by cities. In addition many cities are especially vulnerable to climate change due to their geographical location, infrastructure and concentration of people and capital. In the opening session the core questions and challenges associated with the combined urbanization and climate change dynamic will be discussed. What would a four-degree world look like? How will it affect cities around the world and especially in Asia? How can cities simultaneously cope with the huge challenges of rapid urbanization, climate mitigation and climate adaptation? How can the role of cities as centers of innovation be strengthened?

Chair: Johan Rockström (*Director, Stockholm Resilience Centre*)

09:30 – 10:35

Jim Yong Kim (*President, World Bank*): Investing in Urban Mitigation and Adaptation (*videomessage*)**Ryoji Noyori** (*2001 Recipient of the Nobel Prize for Chemistry*): Tokyo Megalopolis Tackles Climate Change**Hans Joachim Schellnhuber** (*Director, Potsdam Institute for Climate Impact Research*): Climate Change: The State of Play**Brian Schmidt** (*2011 Recipient of the Nobel Prize for Physics*): The Role of Science in Climate Change Engagement**Peter Cookson Smith** (*President, Hong Kong Institute of Urban Design*): The Asian City Context

10:35 – 11:00

Discussion

11:00 – 11:30

Coffee Break

**Session 2: From Ancient to De-Spatialized Hyper-Cities**

Ten millennia ago humans started to gather in larger groups in villages and later in cities. What caused this fundamental change? What drives urbanization and what limits it? When societies become more complex - through diversification and increasing division of labor - they become more efficient, but they also rely more on information. The spatial concentration of larger groups of people enhances sharing and processing of information but also bears the costs that are associated with the necessity of bringing materials and energy from the surroundings into the city. The larger the city grows the larger the supporting hinterland becomes. In preindustrial societies energy scarcity and accordingly high transport costs forced a metabolic limit to urbanization level and the effective size of cities. With the availability of fossil energy these metabolic limits are progressively abandoned leading to urbanization rates and levels unprecedented in human history. Today, cities have the dual role as hubs of innovation, wealth creation and power, and also as prime sources of pollution, disease, global warming and energy and resource consumption. Leading experts will present elements of an emerging theory to explain history, dynamics and organization of cities, and discuss its implications for global sustainability.

Chair: Helga Weisz (*Co-Chair, Potsdam Institute for Climate Impact Research*)

- 11:30 – 12:15 **Sander van der Leeuw** (*Emeritus Dean, School of Sustainability, Arizona State University*): A Co-Evolutionary Understanding of the Origins of Urbanization
Nebojsa Nakicenovic (*Deputy Director General, International Institute for Applied Systems Analysis*): Urban Metabolism - Past and Future
Geoffrey West (*Distinguished Professor and Past President, Santa Fe Institute*): Towards a Science of Cities, Urbanization and Global Sustainability
- 12:15 – 12:30 **Discussion**
- 12:30 – 14:00 **Lunch at Asia Society Hong Kong Center**

**Session 3: The Socioeconomics of City Change**

How can the necessary economic and social changes in cities be brought about? And what will they cost? The leading questions of this session address some of the most challenging problems cities are facing when thriving for sustainability. One of the challenges is that a huge variety among cities exists. Cities differ significantly in terms of size, economic structure, economic and demographic growth-dynamic, existing infrastructure, exposure to climate change, contribution to climate change, risks towards natural disasters and institutional settings. Consequently the options for policy strategies, financing and the actual transaction costs associated with an urban sustainability transition will be very different for cities in Asia, Europe, Africa or the Americas. Leading experts will present low-carbon policies and investment based instruments for cities in Europe and in China. They will discuss options and barriers for a successful introduction, associated costs, appropriate incentives and the role of urban planning for effective urban climate change mitigation and adaptation strategies.

Chair: James Mirrlees (*1996 Recipient of the Nobel Memorial Prize for Economic Sciences*)

14:00 – 14:45 **Jörn Brömmelhörster** (*Principal Economist, Asian Development Bank*): Towards Low Carbon Cities: Economic Context, Requirements, and Policies

Serge Salat (*President, Urban Morphology and Complex System Institute*): Urban Morphology, Spatial Planning, Spatial Economics And Climate Change

Saskia Sassen (*Professor, Columbia University and London School of Economics*)
(tbc)

14:45 – 15:15 **Discussion**

15:15 – 15:45 **Coffee Break**

15:45 – 16:30 **Discussion on Memorandum**
(*closed-door – Memorandum Team, Nobel Laureates and Session Chairs*)

19:00 – 21:30 **Dinner at Asia Society Hong Kong Center**

**Friday, 24th April, 2015: DAY 2****09:00 – 09:30 Registration****Session 4: Anthropogenic Climate Change: Key Results from Intergovernmental Panel on Climate Change Fifth Assessment Report and Recent Findings**

The essential findings of the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC) and the recent literature will be reviewed in this session. The IPCC was established by the United Nations Environmental Programme and World Meteorological Organization in 1988. Its Working Group (WG) I establishes the physical scientific basis of climate change. WG II addresses issues related to impacts, vulnerability and adaptation. WG III is concerned with mitigation measures. The reports by each WG are prepared by hundreds of lead and contributing authors who are acknowledged experts in different fields of climate change research. They are published at an interval of five to six years and have been critically examined by thousands of reviewers. The Conference of Parties of the United Nations Framework Convention on Climate Change uses IPCC information as a baseline for its decision-making process. The latest report (AR5), released in 2013/2014, represents our state-of-the-art understanding of the current state and future evolution of the climate system, and human response options to climate change. In this session, the key results from all three WGs of IPCC will be introduced with a special focus on the implications of climate change for cities.

Chair: Gabriel Lau (*AXA Professor of Geography and Resource Management, The Chinese University of Hong Kong*)

09:30 – 10:15 **Stefan Rahmstorf** (*Co-Chair, Earth System Analysis, Potsdam-Institute for Climate Impact Research*): The Physical Science Basis

Aromar Revi (*Director, Indian Institute for Human Settlements*): Vulnerability and Resilience in an Urbanizing World

Karen Seto (*Associate Dean of Research, Yale School of Forestry and Environmental Studies*): Climate Change Mitigation 2014; an Urban Angle on IPCC's AR5

10:15 – 10:45 Discussion

10:45 – 11:15 Coffee Break

**Session 5: Climate Challenges for Chinese Cities**

China's rapid industrialization over the past two decades has created enormous environmental pressures on many parts of the country. While China's continued urbanization is efficient in terms of economic development, the expected continued migration of Chinese citizens towards increasingly larger cities would likewise bring forth strains in natural resources. At the same time, the country's need to address climate change issues is focusing minds on its energy future, which impacts air quality, mobility, logistics and public health. Session five seeks to knit together these issues from the perspective of Chinese cities. There are three major regional city clusters in China which are not only large population centers but also powerful economic hubs that are foci of culture, technology and education. One of these clusters, the Pearl River Delta region in South China, is also the most vulnerable to storms and sea-level rise. Each of the regional city clusters is interconnected by transport linkages for people and goods, affected by the same regional air emissions, but served by multiple administrative authorities. Understanding the metrics and the collaboration needed to achieve healthy, low-carbon living and sustainable development is no small feat. There is also the practical need of financing this transition with the unavoidable challenge of settling who should pay for what, including on adaptation. The panelists are experts in their respective fields and will share their perspectives on improving liveability in crowded Chinese cities against the many environmental challenges.

Chair: Christine Loh (*Under Secretary for the Environment, The Government of the Hong Kong Special Administrative Region*)

- 11:15 – 12:30
- Evan Au Yang** (*Executive Director, Transport International Holdings*): Sustainable Mobility
 - Sophia Chan** (*Under Secretary for Food and Health, The Government of the Hong Kong Special Administrative Region*): Public Health
 - He Kebin** (*Dean, School of Environment, Tsinghua University*): Air Pollution
 - Jiang Kejun** (*Director, NDRC Energy Research Institute*): Energy
 - Alexis Lau** (*Director, Atmospheric Research Center, Hong Kong University of Science and Technology*): Flooding Risks

12:30 – 14:00 **Lunch at Asia Society Hong Kong Center**



Session 6: The Policy Challenge

As mayors around the globe work to make their cities more sustainable, the policies and technologies on which they rely are often constrained by the absence of adequate or outdated infrastructure to support water management, mobility, energy and resiliency to the threats of climate change. Evidence mounts each day that points to the economic, environmental and social costs of inadequate or totally absent infrastructure to convey stormwater, power homes or shuttle automobiles. Concurrently, as mayors of cities in Asia, Europe and North America work to respond to the challenges of climate change, urban heat islands, drinking water or waste water management, they are finding success with new forms of urban design, planning and engineering. The first goal of this panel will be city representatives to share their stories about the successful implementation of large-scale appropriate infrastructure planning projects and the key political, social, economic and technical attributes leading to their successful application. They will be asked to share stories about the performance benchmarks that defined success, environmentally, economically, socially and politically. The second goal of this panel is to share knowledge and information about best practices policy and technical exchange for global transfer of green infrastructure planning. City representatives will be asked to share their stories about the conditions that they created that led to successful learning, exchange of information and application of ideas from abroad within their own cities.

Chair: Dale Medearis (*Senior Environmental Planner, Northern Virginia Regional Commission*)

- 14:00 – 14:45 **Simon Corbell MLA** (*Deputy Chief Minister and Minister for the Environment, Australian Capital Territory Government*): Canberra Region, Australia
- Morten Kabell** (*Mayor of Technical and Environmental Affairs, Copenhagen*): Copenhagen, Denmark
- Bernd Tischler** (*Mayor of Bottrop*): Innovation City Ruhr, Germany
- K.S. Wong** (*Secretary for the Environment, The Government of the Hong Kong Special Administrative Region*): Hong Kong, China

14:45 – 15:15 **Discussion**

15:15 – 15:45 **Coffee Break**

15:45 – 17:00 **Discussion on Memorandum**
(*Memorandum Team, Nobel Laureates, Speakers, Session Chairs and Participants*)

19:00 – 21:30 **Dinner at J.W. Marriott Hotel**

**Saturday, 25th April, 2015: DAY 3**09:00 – 09:30 **Registration****Session 7: Visions for Places: First Steps by Cities Toward Meeting Climate Change and Sustainability Challenge**

Short inputs by each panelist on specific responses to climate change will be given. This will be followed by questions posed by the moderator to the panel, covering topics such as the role of local government, technology and community in realizing specific city visions, commonalities and differences between individual city responses and the interweaving of climate change mitigation and adaptation into municipal plans to meet other urban shocks and stresses.

Chair: Penny Sackett (*Adjunct Professor, Australia National University*)

09:30 – 10:40

Roger Dennis (*Founder, Sensing City*): Smart Citizens, Sensing Cities**Mario Molina** (*1995 Recipient of the Nobel Prize for Chemistry*): Mexico City's Climate Action Program (via videoconferencing)**James von Klemperer** (*President, Kohn Pedersen Fox Associates PC*): Planning New Cities and Adding to Existing Man-Made Environments – An Architect's View**Mary Ritter** (*International Ambassador & Former CEO, Climate-KIC*): The European Initiative Climate-KIC**Session 8: Perspectives Panel**

This panel will examine some of the emerging challenges for the world's urban areas in a warming world as well as discuss potential technological, social and policy responses. How will these responses be financed, motivated and governed? Who will lead them, who will participate, who will protest and how will tensions be resolved? The global sustainability transition will challenge existing administrative and political structures, requiring them to learn as science advances; anticipate and adapt to new variability; mediate between competing interests with much at stake; and collaborate across sectoral and geographic jurisdictions to respond to change in environmental systems. How can we build some of these capabilities? Are there existing financial and governance structures that we can learn from? What insights can social science and philosophy offer to inform the kinds of institutional design and innovation required to enable and support the kinds of solutions that emerge over the course of the symposium? The panelists will draw on their expertise and experience in governance at various scales to suggest ways that the social infrastructure for sustainability transition can be created.

Chair: Jessica Seddon (*Director, Okapi Research & Sr. Fellow, IIT Madras Center for Technology and Policy*)

10:40 – 11:50

Benjamin Barber (*Senior Research Scholar, Graduate Center, City University of New York*)**Christiana Figueres** (*Executive Secretary, United Nations Framework Convention on Climate Change*) (via videomessage)**Christine Loh** (*Under Secretary for the Environment, The Government of the Hong Kong Special Administrative Region*)**Aromar Revi** (*Director, Indian Institute for Human Settlements*)**Jeffrey Sachs** (*Director, The Earth Institute, Columbia University*) (via



videoconferencing)

11:50 – 12:20 **Presentation and Signing of Memorandum**

12:20 – 12:30 **Concluding Remarks**

12:30 – 13:30 ***Lunch at Asia Society Hong Kong Center***

PUBLIC PROGRAM

13:45 – 14:00 **Guest Registration**

Closing Inaugural Public Program: Innovating for a Sustainable World: Securing a Future for Humanity

“A great innovation is not enough. It must be adopted and used widely to have major impact and that starts with general understanding.” - George Smoot, 2006 Recipient of Nobel Prize for Physics for his insights into the big bang that created the universe

Mankind is living beyond its means. According to the WWF, humans are using 50% more resources than nature can replenish. As such, individuals, businesses and policymakers must consider the impact on the planet of every decision they make – in short, thinking and acting sustainably. Finding or creating innovations to solve sustainability-related problems is crucial to this. Is innovation in and of itself enough to make significant changes to how we can live more sustainably? How can we encourage sustainable innovation from a technological, economic and societal perspective, to enable consumption and production in a sustainable way? How can entrepreneurship be utilized to imagine and actualize innovations to address sustainability-related problems? What are some of the new ideas that could lead to radical shifts and changes in lifestyle? Join us for the closing public program of the *4th Nobel Laureates Symposium on Global Sustainability* during which a distinguished group of experts will engage in a forward-looking discussion on some of the solutions that will ensure humanity can continue to support itself ecologically and economically.

Moderator: Charles Ng (*Associate Director-General, Invest Hong Kong*)

14:00 – 14:20 **Presentations**

George Smoot (*2006 Recipient of the Nobel Prize for Physics*)

Mary Ritter (*International Ambassador & Former CEO, Climate-KIC*)

14:20 – 15:15 **Panel Discussion**

Sonlie Galardi-Este Figueiras (*Founder & CEO, Ekowarehouse*)

Jong Lee (*Chairman, RGL Holdings Ltd.*)

Mary Ritter (*International Ambassador & Former CEO, Climate-KIC*)

George Smoot (*2006 Recipient of the Nobel Prize for Physics*)

CLOSE OF SYMPOSIUM



“4C: Changing Climate, Changing Cities”

Over the past 10 millennia of human civilization, cities have been the source of cultural, technological and economic innovation. With rapidly increasing rates of urbanization since the beginning of the industrial revolution, cities are now the globally predominant form of human settlement. Cities are key drivers of the global environmental change to which they are themselves most vulnerable, but they may also be the catalysts for a global sustainability transition.

The 4th Nobel Symposium “4C: Changing Climate, Changing Cities” seeks to address the most fundamental challenges for cities in a world of rapid climate and socioeconomic change, by exploring past, present and future conditions of urban evolution.

The starting point will be a common definition of the phenomenon “city” and a discussion of the major advantages of density, size and economic specialization. This will prepare the grounds to examine the causal mechanisms behind the historical success of agglomeration as social organization and the changing roles of space and location for the formation of cities.

Preindustrial societies almost exclusively relied on biomass as energy source. The resulting labor intensive energy system and high transport costs force a metabolic limit on the level of urbanization and the effective city size that can be achieved in an agrarian regime. On average, regional urbanization levels cannot exceed 20% as about 80% of the population is needed to generate the energetic surplus to sustain the urban populations. Cities along coastlines and rivers are favored due to the convenient transport those afford.

These conditions have prevailed for most of human history up to the dawn of the industrial age when the ability to harness fossil energy began to fundamentally transform the relationships between labor, energy, space and climate. In the agricultural sector, labor is substituted by energy, and area productivity increases. This leads to huge population growth and the rapidly increasing urbanization more than inverts the previous ratio between rural and urban populations in mature industrial countries. The hinterlands sustaining individual cities expand to an increasingly global scale due to plummeting transport costs which allow exponential growth, densification and economic specialization. The emergence of *de-spatialized hyper-cities* (über-cities) like Hong Kong or Singapore is further assisted by recent innovation in technologies for near instantaneous communication.

Today's world is one of transition in which all of these stages of urban development coexist, sometimes even within a single city. The great challenge of urban sustainability is to strengthen cities as centers of innovation while also mitigating and adapting to global climate change.

Day 1 will focus on the scientific basis for understanding the systemic conditions of urbanization as a co-evolutionary process between nature and society, from the ancient past to a future under severe climate change and will explore the socioeconomics of urban change. Day 2 will review pertinent results from the Fifth Assessment Report of the IPCC and explore the most pressing local and sectoral challenges in Asian cities. Air pollution, water, public health, transport and clean energy for cities in Asia will be discussed from political, technical and socioeconomic perspectives. Day 3 aims to fathom visionary but still attainable futures for cities in Asia and elsewhere. The systemic insights from Day 1, together with the local and sectoral insights from Day 2, will converge into place based visions for specific cities, and into a more comprehensive perspective of sustainable urban systems.

The symposium will close with the presentation of a memorandum signed by the participating Nobel Laureates and the scientific chairs of the symposium.